

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

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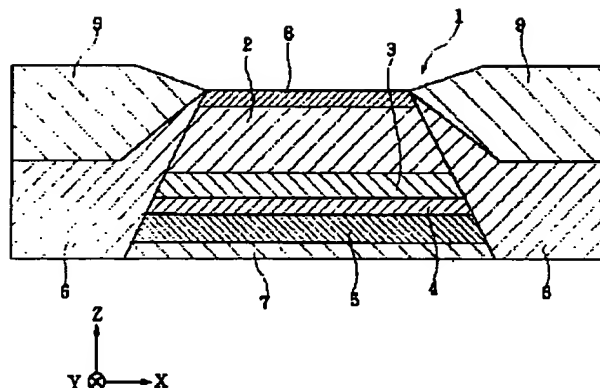
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APPLICATION NUMBER : 10220608

APPLICANT : ALPS ELECTRIC CO LTD;

INVENTOR : HASEGAWA NAOYA;

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TITLE : SPIN VALVE TYPE THIN-FILM  
ELEMENT



**ABSTRACT :** **PROBLEM TO BE SOLVED:** To provide a spin valve type thin-film element constituted to confine the magnetostriction of a free magnetic layer within an adequate range and to make it possible to lessen the generation of Barkhausen noise by adequately adjusting the film thickness and compsn. ratio of the free magnetic layer.

**SOLUTION:** In the case the free magnetic layer 5 is formed of an NiFe alloy film, the magnetostriction may be confined within the range of  $-2 \times 10^{-6}$  to  $1 \times 10^{-6}$  if the film thickness of the free magnetic layer 5 is formed at 30 to 100 angstrom and if the Ni composition ratio of the NiFe alloy film is adequately selected. Then, the magnetic anisotropy dispersion quantity in a height direction by a magnetic elastic effect may be made small and the Barkhausen noise may be reduced.

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